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**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**  
**REGION 10**  
1200 Sixth Avenue  
Seattle, Washington 98101

**SILVER MOUNTAIN MINE  
SUPERFUND SITE  
OKANOGAN COUNTY, WASHINGTON**

**FIVE-YEAR REVIEW REPORT**

July 1997



## I. Introduction

### A. Authority Statement

The U.S. Environmental Protection Agency Region 10 (EPA) conducted this review pursuant to Section 121(c) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended, and Section 300.400(f)(4)(ii) of the National Oil and Hazardous Substances Contingency Plan (NCP). The Silver Mountain Mine Superfund Site ("the Site") is required to have five-year Statutory Reviews to ensure that the remedial action remains protective of public health and the environment and is functioning as designed. This is a Type I review which is applicable to a site where the response is complete.

### B. Site Characteristics

Silver Mountain Mine is an abandoned heap-leach mining operation located approximately six air miles northwest of Tonasket, in Okanogan County, Washington. The Site consists of five acres of privately owned range land. The Site was placed on the National Priorities List in 1984 due to concerns about a cyanide-contaminated leachate pond, saturated mine tailings, and the potential for arsenic and cyanide contamination of the regional groundwater aquifer.

The risk assessment identified arsenic and cyanide as the primary contaminants of concern. The Remedial Investigation (RI) identified and evaluated three potential sources of contaminants at the Site: the heap leach, the unprocessed rock, and the mine drainage water. Potential exposure pathways for contaminants were identified as: on-site soils, on-site surface water, on-site ground water in a shallow aquifer, and off-site ground water in the region. During the RI, the highest arsenic levels found were in the mined material (1080 mg/kg) and in the water from a stock water tank (95 ug/l). Both arsenic and cyanide were also found in the perched shallow aquifer just at the edge of the heap pile.

The Feasibility Study screened 23 various methods of cleaning up the Site. From this list, eight alternatives were developed and evaluated against criteria listed in the NCP. Alternatives ranged from capping on-site to treatment and off-site disposal.



## II. Remedial Objectives

The Record of Decision (ROD) for Silver Mountain Mine was signed on March 27, 1990, and included a number of construction elements to implement the Remedial Action. In October 1994, EPA completed an Explanation of Significant Differences (ESD) to document changes in the Remedial Action due to unforeseen conditions encountered at the Site during implementation of the selected remedy. The remedial action at the Site ultimately included:

- ▶ Consolidating and contouring contaminated mine waste overburden and tailings,
- ▶ Covering and capping the consolidated mine waste and tailings with a soil and clay cap,
- ▶ Fencing the Site to protect the cap and allow seeded grass cover to develop,
- ▶ Closure of the mine entrance and diversion of the mine drainage so that it flows away from the Site, and
- ▶ Deed restrictions on property to protect the cap and provisions for maintenance of the cap.

Construction was completed during 1992 and deed restrictions were established in December 1996.

Maintenance of the Site was begun in the fall of 1993 by EPA with the first application of TORDON for weed control. Since that time, EPA has conducted annual inspections, performed minor fence repair (July 1994), and conducted additional weed control (June 1997). In accordance with the site transfer agreement, Ecology will be responsible for future site maintenance.

The five-year inspection was conducted on May 27, 1997, by representatives of EPA and Ecology and it was determined that the remedial objectives have been achieved. The constructed remedy is performing as designed and is controlling the risks to human health and the environment as specified in the ROD and ESD. The cap was in excellent shape with no evidence of subsidence, erosion, or animal burrows. The grass is well established and provides thorough coverage of the cap; minimal weeds and woody vegetation were growing on the cap. The mine entrance and mine vent were both closed and covered with rocks. Samples of the mine seep were collected and arsenic concentrations ranged from 54.6 to 77.7 ug/l. These values are

well below the acceptable levels (200 ug/l) for cattle drinking the water and human consumption of the cattle (see Explanation of Significant Differences, dated 10/12/94).

### III. Recommendations

The Site should be inspected annually due to the potential for damage to the cap from livestock and trespassers. Ecology has agreed to accept transfer of the Site and accordingly will be responsible for future site inspections and maintenance. The inspections should focus on items that could potentially jeopardize the functionality of the cap (see Silver Mountain Mine Maintenance Plan, December 1994). Items inspected should include cap integrity, vegetative cover, ditch functionality, and closure of the mine entrance and vent. Application of herbicide may be necessary to control noxious and other invasive weeds on the cap. The mine seep drainage should be sampled to monitor the arsenic concentration. The fence should be repaired if necessary to ensure the cap's integrity and maintenance of adequate vegetative coverage.

### IV. Statement on Protectiveness

I certify that the remedy selected for the Silver Mountain Mine Superfund Site remains protective of human health and the environment.

### V. Next Five-Year Review

The next five-year review will be conducted within five years of the date of this review.

Ann Williamson for  
Randall F. Smith, Director  
Office of Environmental Cleanup

7/16/97  
Date

Concurrences			
Initial	BG	ADDailey	SR
Name	7/14/97	Dailey	Steiner-Riley
Date		7/9/97	7/10/97

Krueger